

REMARKS

Claims 1 through 35, 37, 38, 39, 41 through 45 and 47 through 51 remain in this application for active consideration. Claims 36, 40 and 46 have been cancelled.

In the presently outstanding office action, claims 1 through 25, 27 through 32, 43, 45 and 47 through 51 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Waugh (US 4,936,045) in view of Smit et al. (US 4,582,512) and Kindig et al. (US 4,695,290), claims 26, 29 and 30 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Waugh in view of Smit et al. and Kindig et al. and further in view of Schapiro (US 4,618,346), and claims 36 through 42 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Waugh in view of Smit et al. and Kindig et al. and Kamino et al. (US 4,424,062). Applicants respectfully traverse the stated rejections and submit that in view of the foregoing amendments and the following remarks, claims 1 through 35, 37, 38, 39, 41 through 45 and 47 through 51 are patentable over the cited references and that the application is otherwise in condition for allowance.

The remaining independent claims (claims 1 and 45) have each been amended so as to recite that the organic acid used in the hydrothermal washing step is citric acid. This clearly is not taught by the cited references regardless of whether the same are considered alone or in some sort of combination. Smit et al. describe a three step process comprising (1) a sodium hydroxide leach, followed by (2) a hydrochloric acid leach and then (3) a high temperature water or ammonia leach. The objective of the high temperature water or ammonia leach is stated as being "... to reduce the residual sodium and chlorine content of the coal to as low a level as possible." (Col. 4, ll. 33-35). Smit et al. teach further that the purpose of the high temperature water or ammonia Leach is solely for Na and Cl removal. This differs from the present invention. In particular, it is clear that the

hydrothermal washing process of the present invention "... reduces the level of sodium, silicon, iron and titanium in the coal ..." (see paragraph 0098 of U.S. patent publication no. 2006/0096166 A1).

Smit et al. go on to state that the wash needs to be conducted at high pressures due to the fact that "... sodium and chlorine are absorbed in the fine pore structure of the coal and cannot be removed at atmospheric pressure." (Col. 4, ll. 36-38). While Smit et al. do teach the use of a hydrothermal washing step to enhance removal of sodium and chlorine, the examiner has correctly pointed out that Smit et al. does not disclose use of polar organic solvents or an organic acid, as disclosed in the present invention, in this step. As such, Smit et al. does not teach that the hydrothermal wash step should be conducted with a compound capable of expanding the coal structure to effect removal of inclusions, particularly Si, Fe and Ti.

The examiner then combines this high temperature water or ammonia leach as disclosed in Smit et al. with the washing step outlined in Kindig et al. But Kindig et al. and Smit et al. very specifically talk about the removal of halogens. At col. 14, ll. 19-35, Kindig et al. refer to "washing ... to remove dissolved cations and anions", i.e., elements that are already in solution, and Kindig et al. and Smit et al. are simply washing these elements out.

This is in contrast to the present application looking at dissolving the minerals. Without the benefit of hindsight, the skilled person would not read Smit et al. or Kindig et al. as referring to washing out dissolved anions and cations (particularly halides) and think that the same approach might be used to dissolve minerals like silica.

Kindig et al. further teaches that "... additional halogen removal can also be effected by addition of various compounds such as acetic acid, nitric acid, alcohol (90% ethanol, 5% methanol and 5% isopropyl) and ammonium hydroxide ...". (Col. 14, ll. 29-33). Halogens refer specifically to the non metallic group 17 elements, such as F, Cl, Br and I etc. The applicant

contends that the present application makes no mention of the removal of halogens, or the desire to remove them. As stated previously, it is made clear that the hydrothermal wash step of the present invention is for the purpose of removing Na, Si, Fe and Ti. Indeed, there does not appear to be anything in Kindig et al. to suggest the use of acetic acid, nitric acid, alcohol or ammonium hydroxide at low temperatures to remove Na, Si, Fe or Ti. Furthermore, the present invention is particularly focused on and now claims the use of either water and citric acid or water and a polar organic solvent under hydrothermal conditions. Kindig et al. makes no mention of citric acid, and offers a specific alcohol blend as opposed to a polar organic solvent, specifically ethanol.

The examiner then states that "It would be obvious to one of ordinary skill in the art to add the carious [sic.] compounds that KINDIG et al. teaches to the high temperature water leach step that SMIT et al. teaches.... KINDIG et al. teaches that the addition of the various compounds can effect additional halogen removal."

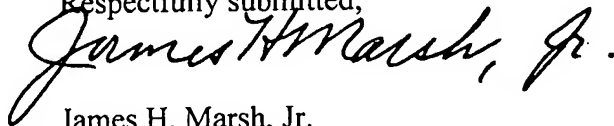
Smit et al. teach a hydrothermal wash process, using water or aqueous ammonia at high temperature and pressure, for removal of Na and Cl. Kindig et al. teaches use of acetic acid, nitric acid, alcohols or ammonium hydroxide at low temperatures for the removal of halogens. It would not be obvious for the skilled person to even try a reagent for low temperature removal of halogens for the high temperature removal of non-halide materials such as Si, Fe and Ti as in the present invention. Even if the skilled person were to consider it obvious to try the reagents of Kindig et al. in the process of Smit et al. and Waugh et al., they would do so without any expectation of success. Neither document discusses a hydrothermal step for removal of Si, Fe and Ti. Neither document teaches using ethanol or citric acid under hydrothermal conditions for the removal of Na, Si, Fe and Ti. Accordingly, the applicant submits that combination of these documents can not result in anticipation of the present invention or in rendering the same obvious.

In view of the foregoing, it is clear that the rejection of independent claims 1 and 45 should be withdrawn. Since rejection of each of the dependent claims relies, at its base, on the combination of Waugh et al., Kindig et al. and Smit et al., rejection of all claims dependent from claims 1 and 45 should also be withdrawn.

In addition to the foregoing, claim 47 was rejected as being indefinite for failing to point out and distinctly claim the subject matter which the applicant regards as the invention. Claim 47 has been amended to overcome this objection.

In view of the foregoing amendments and remarks, it is respectfully submitted that the claims remaining in the application for active consideration are free of the cited prior art and that the application is otherwise in condition for allowance. Accordingly, favorable action at an early date will be appreciated. If the examiner is of the view that any issue remains unresolved, it is respectfully suggested that applicants' undersigned attorney may be contacted at the telephone number set forth below.

Respectfully submitted,



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